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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,183	02/27/2002	Wen-Chun Zheng	03226.111001;P6259	1430
32615	7590	11/28/2003	EXAMINER	
ROSENTHAL & OSHA L.L.P. / SUN 1221 MCKINNEY, SUITE 2800 HOUSTON, TX 77010			CHU, CHRIS C	
			ART UNIT	PAPER NUMBER
			2815	
DATE MAILED: 11/28/2003				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/085,183

Applicant(s)

ZHENG ET AL.

Examiner

Chris C. Chu

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 - 17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 - 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Sherif et al.

Regarding claims 1 and 9, Sherif et al. discloses in e.g. Fig. 2 a flip-chip package assembly comprising:

- a package substrate (10) having a mounting surface;
- a semiconductor die (20) mounted on a first portion (e.g., the recessed area under one of the dies (20), such as the leftmost die of the Fig.²₁) of the mounting surface;
- a heat removal device (35) physically secured to a second portion (an area under 28 and any place other than the first portion) of the mounting surface; and
- a thermal interface material (23) disposed between the semiconductor die and the heat removal device.

Regarding claims 2 and 10, Sherif et al. discloses in Fig. 2 and column 6, line 61 the heat removal device being a heat sink.

Regarding claims 3 and 11, Sherif et al. discloses in Fig. 2 the heat removal device being physically secured to the second portion of the mounting surface by an adhesive (28).

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Regarding claims 4 and 12, Sherif et al. discloses in Fig. 2 the adhesive (28) being disposed at a plurality of discrete locations on the second portion of the mounting surface.

Regarding claims 5 and 13, Sherif et al. discloses in Fig. 2 and column 6, line 43 the adhesive comprising eutectic solder paste.

Regarding claims 6 and 14, Sherif et al. discloses in Fig. 2 and column 6, lines 13 - 14 the thermal interface material being selected from the group consisting of low melt solder phase change material, thermal tape and thermal grease.

Regarding claims 7 and 15, Sherif et al. discloses in Fig. 2 a bottom surface of the heat removal device comprising at least one recess (33, at the left) for accommodating the semiconductor die.

Regarding claims 8 and 16, Sherif et al. discloses in Fig. 2 the bottom surface of the heat removal device further comprising at least one recess (e.g., any other recess 33, such as the rightmost recess) for accommodating at least one electrical component (e.g., a second die) mounted on the second portion of the mounting surface.

Regarding claim 17, Sherif et al. discloses in Fig. 2 a flip-chip package assembly, comprising:

- supporting means for providing support (10) to a semiconductor die (20);
- heat removal (35) means for dissipating heat from the semiconductor die;
- interfacing means (23) for transferring heat from the semiconductor die to the heat removal means; and
- attaching means (28) for attaching the heat removal means to the supporting means.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lofland et al., Gonsalves et al., Tseng et al., Yoshikawa, Collins et al., Turlik et al., Brzezinski disclose the semiconductor package.

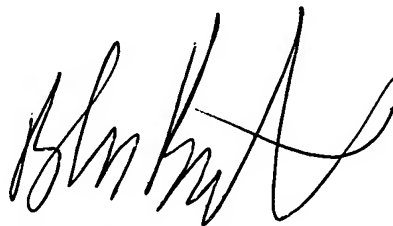
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu
Examiner
Art Unit 2815

c.c.
11/24/03 3:43:56 PM

A handwritten signature in black ink, appearing to read 'B. William Baumeister', with a stylized, flowing script.

B. WILLIAM BAUMEISTER
PRIMARY EXAMINER